

THE NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

Vol. 5 No. 3

PATHFINDER

THE GEOSPATIAL INTELLIGENCE MAGAZINE

MAY/JUNE 2007



IN FIELDS AFAR, NGA
PRODUCT MAY BE
WARFIGHTERS' ONLY FRIEND



NAVAL STRIKE AND
AIR WARFARE CENTER
GETS GEOINT

NGA SUPPORTS **American
HEROES**



ON MY MIND

NGA Makes a Difference with Warfighter Support

Throughout history, geospatial intelligence has supported military operations. During World War I and World War II, aerial imagery and its analysis were key elements of battlefield intelligence. Throughout the Cold War and Vietnam, America's "eyes in the sky" kept close watch over our adversaries and provided pivotal support to our troops on the ground. Following the Cold War, the appreciation for GEOINT continued to grow; it was marked by the creation of the National Imagery and Mapping Agency (NIMA). In NIMA, defense and intelligence entities merged to form one cohesive, powerful vehicle for distributing collaborative, timely intelligence to our warfighters wherever they needed it—at any point around the globe. The National Geospatial-Intelligence Agency (NGA), 11 years later, has emerged as the premier provider of GEOINT and the keystone for tactical and operational planning in the defense and intelligence communities.

Today, America is fighting a long war against an agile and unconventional enemy on numerous fronts around the world. These are unprecedented times for NGA and for GEOINT support to the warfighter. Our men and women in uniform rely on NGA to proactively deliver GEOINT products to support their critical operations. The President has charged the defense and intelligence communities with the task of increasing support to military efforts in Iraq and Afghanistan. To help win the fight, NGA must ensure that GEOINT is absorbed into the decision space of operational partners through the use of on-site analytic support. We must also sustain essential reach-back support across all NGA locations. Our primary responsibility is to provide timely, accurate and reliable GEOINT to our forward-deployed analysts and partners worldwide.

One of our Agency's key focus areas is to "look outward and be the most collaborative partner with the Intelligence Community and the warfighter." We are working hard to accomplish this goal. As you read this edition of the Pathfinder, you will learn about NGA's critical support to our IC partners through our NGA Support Teams, the recent mission expansion in Iraq and Afghanistan and our support to the Naval Strike and Air Warfare Center. NGA support does not stop there. GEOINT is involved in every aspect of analysis and military operations. What NGA analysts do on a daily basis is unmatched by the work of any other intelligence agency. Whether troops are targeting insurgent hideouts, searching for improvised explosive devices, or tracking Taliban movements, their missions always hinge upon a lowest common denominator—a geographical coordinate. We must continue to work with our mission partners and our allies abroad to generate the tailored, diverse and detailed multi-intelligence products that our warfighters need for mission success.

NGA-provided GEOINT, in its various forms, keeps American citizens safe and enables our warfighters to protect the security of our nation. NGA is most proud of the men and women who have volunteered to deploy to theater and for those who serve in reach-back positions in support of the mission. NGA employees enlisted with the NGA Volunteer Deployment Team will be called upon at some point in their career to provide close-in support to our warfighters. Participation in the deployment program is not only a rewarding experience, but in the future will be a key ingredient in advancement to a leadership level within the IC.

NGA must remain on the offense and be proactive in the long war. We are fighting an enemy much different than we encountered during most previous conflicts. We must commit our resources to the fight against violent extremism while balancing GEOINT needs for the rest of the world. We must be prepared to sustain our current operational tempo for a significant period and do whatever it takes to get the right information from the first to the last tactical mile. As intelligence professionals, we are America's first line of defense against our adversaries. Our soldiers need what we bring to the fight, and NGA will continue to *make a difference with the warfighter*.


ROBERT B. MURRETT
Vice Admiral, USN
Director



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ON THE COVER

A U.S. Army captain in Baghdad works with local authorities to identify public buildings on a map in a photo by Pfc. James Matise, courtesy of the U.S. Army. To the people of NGA, the captain on the cover and all the men and women who serve our country in uniform are our American heroes. Many of us have supported them in an operational environment. We feel confident they will make a difference in the long war against violent extremism, and we value the confidence they've shown in the products and services we provide. In this Pathfinder, dedicated to our warfighters, our objective is to show how NGA is making a difference with the highest quality geospatial intelligence we can provide.



LETTER TO OUR READERS

NGA Supports American Heroes

The themes of our last two issues on military support were “Going to War with GEOINT” and “More (GEOINT) Power to our Warfighters.” Both themes rightly characterize the confidence in NGA products and services held by our men and women in uniform. With this issue’s theme—“NGA Supports American Heroes”—we express how we feel about our warfighters and why we are committed to provide them the very best we have to offer.

You’ll find that most of the articles do, in fact, describe ways that NGA people are providing our warfighters the highest quality GEOINT we can produce. We also include an article by Air Force Maj. Gina Prevett, who came to NGA from Iraq and now works in acquisition, evaluating contract proposals and managing funding issues related to the integration and modernization of the National System for Geospatial Intelligence. Her NGA work makes an important contribution to our warfighters, for sure, but in this issue, the major shares experience she gained on the streets of Sadr City. I think you’ll find “What I Learned about Iraq and Myself” gives an accurate accounting of the situation in Iraq and articulates the value of deployment.

Another story from outside NGA comes from the Army Intelligence Center at Fort Huachuca, Ariz. In “Army Is Building ‘Space to Mud’ GEOINT Enterprise,” Chief Warrant Officer Thomas R. Dostie provides insight on how GEOINT is seen in the Army and what the Army hopes to accomplish with it.

The articles about NGA lead off with “In Fields Afar, NGA Product May Be Warfighters’ Only Friend,” by Sabine Pontious and Kevin Boyer. This story provides a powerful example of how NGA is striving to support our warfighters, literally at the last tactical mile. Two other articles describe NGA support to a specific set of customers: soldiers preparing for a mission at Fort Hood, Texas, and warfighters in training at the Naval Strike and Air Warfare Center in Fallon, Nev.

The article “Warfighters Get a Lift from Projects with MERIT,” by Air Force Maj. Doug Brick, explains how NGA gives a boost to especially promising developmental projects. The article “Using Lessons Learned to Support Warfighters,” by John Hudson, describes how NGA captures ideas from the workforce to improve future GEOINT support. Our departments also offer worthwhile insights into warfighter support, both in the past and in the future.

The July-August Pathfinder will look at NGA’s newest mission: homeland security and homeland defense.




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PATHFINDER

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GETTING PUBLISHED

All members of the geospatial intelligence community are welcome to submit articles of community-wide interest. Articles are edited for style, content and length. The copy deadline is the last Friday of the third month before publication. For details on submitting articles, send an e-mail to pathfinder@nga.mil.

The *Pathfinder* is the medium with which the National Geospatial-Intelligence Agency enhances and promotes public awareness and understanding of the discipline of geospatial intelligence. The *Pathfinder* is an authorized Department of Defense publication for members of the Department of Defense. Contents of this publication are not necessarily the official view of, or endorsed by, the U.S. government, Department of Defense or NGA. Articles in the *Pathfinder* may be reproduced in whole or in part without permission, unless stated otherwise. If they are reproduced, please credit the author and the “National Geospatial-Intelligence Agency, the *Pathfinder* magazine.” Any reproduction of graphics, photographs and imagery is subject to the original copyright.

UP FRONT

NGA Supports Wounded Service People

BY HEIDI NAGEL

Combat veterans arrived at the National Counterterrorism Center (NCTC) to roaring applause from a large and diverse group of Intelligence Community employees during a recent American Heroes Day. NGA was honored to be one of several government agencies invited to send representatives to meet with wounded service people currently undergoing rehabilitation at Walter Reed Army Hospital in Washington, D.C., and the National Naval Medical Center in Bethesda, Md.



NGA representatives discuss employment opportunities with combat veterans during American Heroes Day at the National Counterterrorism Center.

After surviving catastrophic injuries, these men and women are faced with the challenge of determining a new career path. The goal of the event was to provide them with knowledge about employment opportunities and reassurance that their skills and experiences have many applications at NGA and other government agencies. In addition to attending the employment-information session, the wounded heroes were served lunch and given an overview briefing on the NCTC and a tour of the operations center. The service people and their families were clearly overwhelmed and appreciative of the information and recognition. NGA is scheduled to attend the next Heroes Day in May. P

HEIDI NAGEL

was one of the NGA representatives taking part in American Heroes Day. She is an NGA Staff Officer in the Corporate Communications Division's Conference Branch.



DNI Visits NGA

On April 13, Director of National Intelligence (DNI) Michael McConnell addressed the NGA workforce to go over his vision and challenges facing the Intelligence Community (IC). McConnell emphasized the need for better collaboration between intelligence agencies and how the IC must strike a delicate balance between “sharing information and protecting sources and methods” in order to be successful. NGA is one of several intelligence agencies recently visited by the DNI.



Photo by Rob Cox



Photo by Rob Cox

FROM THE MILITARY EXECUTIVE

Surge Support Is Critical

BY AIR FORCE BRIG. GEN. MICHAEL F. PLANERT, NGA MILITARY EXECUTIVE AND DIRECTOR FOR MILITARY SUPPORT

Our nation is involved in a long fight to win the global war on terrorism. As a pilot, commander and staff officer, I know how important geospatial intelligence (GEOINT) products are; I've used them. I've seen how GEOINT supports tactical operations in Bosnia and Africa, as well as at strategic headquarters, such as the National Military Command Center and Allied Air Forces Southern Europe. To help ensure victory, President George W. Bush recently announced an increase in the number of U.S. forces deployed to Iraq and Afghanistan. Our forces will not be successful without significant intelligence support. For NGA, providing the best GEOINT to support this operation is the number-one priority; our troops deserve nothing less. We must sustain a high operational tempo of support for an extended period, 24/7.

Volunteering to Support Critical Missions

Warfighter support begins with volunteers. NGA's model of forward-deploying analysts is a success story, and additional analysts will be needed to support critical missions primarily in Afghanistan and Iraq. I encourage every NGA employee with GEOINT expertise to consider this special call to service. Working on deployment is rewarding and necessary to win the long war.

I echo Admiral Murrett's message that "we must retain our sense of urgency and work as a unified community of experts, producers and partners, providing the data and knowledge our nation needs." Forward-deployed analysts must leverage the entire Agency to provide critical, on-site GEOINT support: a forward presence of our capabilities. Those who work in faraway places should be seen as the main effort for the organizations they support, which entails detailed preparation and training.

Taking a Forward-Thinking Approach

Rapid change on the battlefield calls for rapid reaction from the analyst. Our nation's enemies operate in smaller groups, with often deadly intentions. The forward-deployed NGA analyst must anticipate the requirements of the command, produce GEOINT products to meet those requirements and proactively push products to the warfighter. This forward-thinking approach should be pursued not only for those personnel forward deployed, but also for those GEOINT analysts working at the home station. When



Brig. Gen. Planert meets with Marine and Navy partners on the USS Bonhomme Richard to discuss efforts to support the surge.

analysts proactively engage and contribute to their host command element, they become fully integrated members of the organization. This synergy from the most reliable expertise and analysis enables better decisions to be made and lives to be saved. The current operations tempo does not afford NGA analysts the time to wait for requirements to be received prior to beginning GEOINT production.

I can tell you firsthand from my own travels and time in service that support to the war on terrorism isn't easy. You can expect to work long, difficult hours with many people relying on your expertise. You may witness the thrill of a small victory when a weapons cache is discovered. You may also feel the agony of defeat when precious lives are lost to an improvised explosive device. One deployed analyst said of his experience, "To feel part of such a talented, dedicated and selfless group has humbled me." You may not even know the impact of your good work. How many Americans or allied partners trekked five miles instead of 20 because your maps were accurate? How many came

“NGA can help shorten the conflict and ensure victory by deploying GEOINT experts overseas and by fostering a mindset of excellence throughout the organization”

—Brig. Gen. Michael F. Planert

home alive because of your dedication and excellence? Indeed, the mission comes down to helping those beside, in front of and behind you. What better way for NGA to understand that than by directly supporting those who need it most?

Focusing on Joint GEOINT Activity

Another example of our focus on supporting the war on terrorism and addressing warfighter demands is NGA's partnership with U.S. Joint Forces Command to form the Joint Geospatial-Intelligence Activity (JGA), bringing combatant commanders, services and agencies together to assess baseline capabilities and evaluate options to enhance GEOINT support to and from national, theater and tactical users. The JGA effort is based on the critical need of our forces and those of our partners for timely, accurate and usable GEOINT data to support the warfighter to the last tactical mile.

In addition to more forward support, NGA can pursue other goals and objectives to enhance the warfighting effort. First, NGA senior leaders can benefit from deploying to and/or traveling to battlefield areas. It's one thing to read about wars being fought overseas; it's quite another to put your boots in the hot desert sand and be a part of the daily grind that our troops face every day. Second, NGA must continue to recruit and train first-rate deployers.

A U.S. Army soldier provides security so his fellow soldiers can move to an enemy weapons cache point on the side of a mountain in Mandikowl, Afghanistan.

The need to embed analysts with our nation's deployed forces will not go away anytime soon. Last, we must develop our relationships with the commands we support to become full mission partners and make our data available at the lowest possible classification to our warfighting partners. By better understanding the command's mission, NGA can better tailor its products to support the warfighter's objectives.

The global war on terrorism will continue. NGA will do our part to shorten the conflict and ensure victory by deploying GEOINT experts overseas and by fostering a mindset of excellence throughout the organization. Victory is obtainable; you will help make it happen. P

AIR FORCE BRIG. GEN. MICHAEL F. PLANERT

is a command pilot who led a special operations task force during NATO operations in Bosnia and the air portion of a non-combatant evacuation operation in Africa. He came to NGA from an assignment with Allied Air Forces Southern Europe as a Combined Air Operations Center Deputy Commander.





NGA Is There

Working alongside warfighters, wherever the action takes them, continues to be a hallmark of NGA support. The Agency relies on volunteers from the workforce who deploy with warfighters to meet their unique needs for geospatial intelligence in the operational environment. These volunteer deployers build tailored products on site and reach back to NGA to augment their support in an effort that maximizes both the power of Internet connectivity and the efficiency of face-to-face collaboration.

Whether troops are targeting insurgent hideouts, searching for improvised explosive devices, or tracking Taliban movements, their missions always hinge upon the lowest common denominator—a geographical coordinate.

The overwhelming comment from volunteers returning from their deployments is that the experience provided tremendous satisfaction in seeing firsthand the results of their work—to the point of saving lives. It gave them great insight into the value of NGA's service and support, they recount. As for their own careers, they say it inspired them to achieve new heights. Thanks to NGA deployers, our nation's warfighters can count on a collaborative partnership and the best GEOINT available—where and when they need it. "I am extremely proud of the outstanding job our deployed personnel are doing to provide our national security," wrote NGA Director Vice Adm. Robert B. Murrett in a recent e-mail to the workforce, "We must retain our sense of urgency and work as a unified community of experts, producers and partners, providing the data and knowledge our nation needs."





In Fields Afar, NGA Product May Be Warfighters' Only Friend

BY SABINE PONTIOUS AND KEVIN BOYER

Picture this: a small Army unit plans an operation in the embattled Tall 'Afar area of Iraq, the site of historic clashes between coalition forces and insurgents. These young soldiers are alone, cut off from their comrades and from modern comforts and technology—but they are armed with a laptop loaded with data about the countryside around them. They are using an NGA product called Geospatial Intelligence for Operations Support and the Battlefield, or GIB, a handful of DVDs containing an array of imagery and geospatial products.

The soldiers are grateful for GIB's simplicity: A geospatial information system (GIS) bundled with the product allows them to manipulate the various "layers" of data to create their own customized, fused view without requiring any GIS expertise. They simply need to know how to navigate in a Web browser environment. In fact, within one hour of receiving GIB from an NGA technical representative, the soldiers have taken it on patrol and are using it to better visualize and understand their surroundings. This is a true story.

Wealth of Data, Ease of Use

GIB provides an amazing variety of data. For example, Controlled Image Base® is unclassified digital imagery

The ability to access and analyze imagery and geospatial information in the field is available through an NGA product called Geospatial Intelligence for Operations Support and the Battlefield, or GIB.

ideal for providing locational awareness in emergencies. Handheld photographs and movies include 360-degree immersive photos (similar to virtual real-estate tours) and video with embedded coordinates. Imagery obtained through light detection and ranging (LIDAR), a technology similar to radar, is used in line-of-sight and urban warfare planning. The data includes a catalog of standard NGA products, including Compressed Arc Digitized Raster Graphics, Vector Map, Digital Terrain Elevation Data and Digital Aeronautical Flight Information Files, as well as precise targeting data.

The sheer volume of accessible data is staggering. Using "MrSid" compression technology, NGA is able to load 20 DVDs' worth of data onto one DVD. But GIB's greatest attribute is its ease of use: With point-and-click navigation through interactive displays, even novice users can quickly become experts at GEOINT. Users are able to save the custom views they create and insert them into other applications, including briefings. A mere few years ago, it would have been unthinkable to offer such high-end GIS capabilities in such a compact, user-friendly package.

Meeting the Challenge

What is the origin of GIB? In 2004, then NGA Technical Executive (TX) Roberta Lenczowski approached a few of the Agency's geosciences experts and challenged them to devise a geospatial data and imagery package to send forward to warfighters. She stipulated that the package be self-contained, presented in a universal format (with no constraining system requirements) and simple to use, as well as free to users. At the time, NGA was able to send out similar packages on an ad hoc basis, but demand was limited, because users had to be experienced with GIS applications and already possess the software.

The staff quickly met the TX's requirements. Within about a year, the original prototype had become a viable product. Now, the Defense Logistics Agency, distributor of NGA products, offers 70 NGA GIB titles with three or four DVDs each, covering individual countries or regions. Recently, during just one month, a team of four analysts compiled six multi-DVD GIBs over countries in the Horn of Africa.

Photo courtesy of U.S. Marine Corp.



Photo courtesy of DoD

A new NGA product gives warfighters situational awareness on their laptops with a handful of DVDs containing imagery and geospatial information and an easy-to-use geographic information system to analyze it.

A Widening Circle of Users

Although GIBs were initially developed for warfighters, they are now being used in an ever-widening circle of homeland security applications—of course, conforming to strict congressional oversight of domestic imagery. In early March, GIB data was collected for Twentynine Palms, Calif., and delivered to the Marine Corps Air Combat Center there. The Marines are using it to train troops for urban combat and route reconnaissance. NGA provided a New York State GIB to the Army National Guard in Albany late last year, prompting a request for additional homeland security imagery. Even the Las Vegas Metropolitan Police Department became fans: The Intelligence and National Security Manager in the Homeland Security Bureau declared, “The flexibility of this tool is phenomenal.”

NGA’s goal with GIB, as with all of our products, is to provide our government and civil partners with the easiest access to the most useful GEOINT information. End of story. P

Note: The Geospatial Intelligence for Operations Support and the Battlefield (GIB) program is an example of a collaborative effort across several NGA offices. It is very similar to NGA’s current support to Geospatial-Intelligence Contingency Packages, formerly in hardcopy called Noncombatant Evacuation Operations Packages, or NEO-Packs. As NGA migrates toward a data-centric environment, the GIB and GCP programs will converge to provide a single service to the National System for Geospatial Intelligence community.

SABINE PONTIOUS (Left) KEVIN BOYER (Right)

Sabine Pontious is a Booz Allen Hamilton contractor supporting communications for the Source Operations and Management Directorate. She has also performed outreach and communications for the Analysis and Production Directorate and Office of Corporate Relations.

Kevin Boyer is an image scientist in the Source Operations and Management Directorate, specializing in custom data sets for geographic information systems. He started government service in 1983 and has also worked as a cartographer and geospatial analyst.





Army Building ‘Space to Mud’ GEOINT Enterprise

BY ARMY CHIEF WARRANT OFFICER 4 THOMAS R. DOSTIE

The U.S. Army Intelligence Center and Fort Huachuca, Ariz., where the center is located, have become lead elements for geospatial intelligence (GEOINT), while embracing NGA's stewardship as the discipline's Functional Manager. Headquarters, Department of the Army (HQDA) Intelligence (G2), the Army Intelligence and Security Command and the Army Engineering Topographic Center, all at Fort Belvoir, Va., and the Army Engineer School at Fort Leonard Wood, Mo., have also embraced NGA's GEOINT stewardship. Together, we are building a “space to mud” GEOINT enterprise.

Army/NGA Engagement Plan

Major Gen. Barbara Fast, Commanding General of the Army Intelligence Center and Fort Huachuca, designated GEOINT as an intelligence discipline within the Army in February 2006. That set in motion many fast-paced, simultaneous efforts to capitalize upon and further develop GEOINT. Under Fast's guidance, the Deputy Commandant, Jerry V. Proctor and I developed the Army Intelligence

Center/Fort Huachuca-NGA Engagement Plan. It was subsequently briefed to, and garnered support from, the senior managers of NGA, including the Director, resulting in an evolving and successful partnership.

The Army was the first military service and first Department of Defense (DoD) organization to fully embrace NGA's stewardship of GEOINT, recognizing NGA as the GEOINT Functional Manager and supporting the creation of a GEOINT enterprise referred to as the National System for Geospatial Intelligence, or NSG. In a cradle-to-grave study, also known as C2G, the Army in March 2006 completed a full assessment of GEOINT impacts to doctrine, organization, training, materiel, leader development, personnel and facilities. Work is nearing completion to identify, facilitate and integrate solutions to these impacts.

Common GEOINT Enterprise

Both the Army and NGA are striving to create a common GEOINT enterprise that gets intelligence to the warfighter



U.S. Army photo

The Joint Intelligence Combat Training Center at Fort Huachuca, Ariz., now includes GEOINT training as part of its technical certification course. The Army is currently building a GEOINT enterprise that also calls for GEOINT cells in field units.

faster and with increased context, accuracy, depth and synchronization. Partnering with NGA as Functional Manager provides opportunities for synergy that can benefit both. For example, Army intelligence can directly task ground-based instruments to capture still photography, while NGA can provide national resources that ensure fully functional and integrated GEOINT operations to the last tactical mile.

Functioning as an enterprise also ensures that the members and partners operate under a common set of standards, further ensuring information sharing, system compatibility and interoperability, as called for in the Distributed Common Ground Station (DCGS) concept. (The DCGS concept calls for a single, network-centric, distributive and collaborative enterprise, similar to e-commerce, for the Department of Defense.) For example, the teaming of Army and Marine Corps personnel, through the DCGS, would consolidate ground-component requirements and allow for a more efficient NGA/military response. At the same time, common GEOINT training, online or on site, would allow the Army to leverage NGA expertise.

Elements of military intelligence (MI) and engineering are already working together to form GEOINT cells in field units, especially within brigade combat teams (BCTs). The embedded cells allow imagery specialists and terrain (geospatial) analysts to work side by side to provide GEOINT to the warfighter. Engineer soldiers combine military-intelligence communications from many sources, enabling improved products. When the MI flagship system, DCGS-Army, is operational, soldiers from all the MI disciplines will also be able to collaborate online.

GEOINT Training

Meanwhile, the Army Intelligence Center has reconfigured GEOINT training in record time to reflect what needs to be accomplished now. Efforts began in December 2005 when 75 imagery intelligence (IMINT) soldiers from all over the world took part in a review of their occupational skills, which resulted in many dramatic changes. The following month, training for the new GEOINT cells was up and running, as training authorities, anticipating approval, had quickly revised lesson plans and exercises and acquired new equipment. Combining resources with the Joint Intelligence Combat Training Center (JI-CTC) also helped to speed the process. The entire effort was an excellent example of teaming across company, battalion, brigade

and intelligence-school boundaries, while command support for such a complex undertaking on short notice was crucial.

Training is geared toward all skill levels. Recently non-commissioned officers from three occupational specialties and warrant officer unmanned aerial vehicle technicians gave positive feedback about the training, including some who stated that it was the best training they had received in their entire careers. The Deputy Commandant for Training and the 11th MI Brigade Commander both support instructing soldiers in skills above what may be required at their current rank, since many will be placed in positions of responsibility sooner rather than later. The JI-CTC is including the training as part of its technical certification course.

The Army Intelligence Center trains hundreds of IMINT commissioned officers, warrant officers, non-commissioned officers and enlisted soldiers each year. Many NGA senior managers and analysts, including officials of the National Geospatial Intelligence College, have observed the GEOINT training, which has been recognized as among the most advanced in the military intelligence community.

NGA has started the process of designating Fort Huachuca as the Intelligence Community GEOINT Center of Excellence. Deploying NGA analysts will train with GEOINT cells prior to arriving in theater to work with Army units.

NGA is supporting and collaborating with the Intelligence Center in developing GEOINT doctrine for Army, Marine Corps and MI-specific doctrinal guides and NSG doctrine. The Agency has encouraged the Army to coordinate all GEOINT doctrine with the Marine Corps to ensure that total ground-component requirements for doctrine agree and are consistent with joint doctrine. This is a great collaborative endeavor; it sounds like a GEOINT enterprise! P

Editor's Note: This article is based on a longer article that appeared in the January-March 2006 Military Intelligence Professional Bulletin.

ARMY CHIEF WARRANT OFFICER 4 THOMAS R. DOSTIE

is Senior Imagery Advisor at Fort Huachuca, Ariz. His Intelligence Community assignments have included the CIA, Defense Intelligence Agency and NGA. He has served with the United Nations and NATO, including duty as nuclear arms treaty inspector. His overseas assignments have included Honduras, Korea and Europe.



NGA Trains Puerto Rico National Guard

BY JOSEPH RIGGS

“We have some Puerto Rico Army National Guard soldiers that need FalconView™ training,” Staff Sgt. Katie Phelps, an all-source intelligence technician with the Southwest Army Reserve Intelligence Support Center, told members of the Army NGA Support Team at Fort Hood, Texas. FalconView™ is a portable computer mapping system that pilots use in flight planning.

The Puerto Rico guard members received specific data sets over the Sinai Peninsula for their upcoming one-year service as peacekeepers with the Multinational Force and Observers (MFO). The MFO’s peacekeeping force supervises implementation of the security provisions of the Peace Treaty between the governments of Egypt and Israel in the Sinai Desert, Straits of Tiran and Gulf of Aqaba.

Fifty copies of a special reference graphic provided by an Army unit returning from the MFO were also printed. Coordination with the local Fort Hood command was a key element in making the training a success. The Technical Division of the Central Technical Support Facility (CTSF-TD) at Fort Hood provided classroom space and technical expertise on the functionality of the Army Battlefield Command System. John Seibert of the CTSF-TD continued his promotion of NGA products and services as co-instructor.

Two-Year Effort

For two years, the 75th Infantry Division (Training Support) has engaged NGA’s Office of Military Support and the National Geospatial Intelligence College for FalconView™ training. Soldiers are trained on the basics of the program, using the NGA course “Geospatial Information and Services for the Warrior” or a shorter, locally produced course.

The college sends a mobile training team for a four-day course that teaches the soldiers the basics of geospatial intelligence (GEOINT) products, map ordering and FalconView™. This is the preferred method for training infantry soldiers on FalconView™. If the unit does not have time for four days of training, NGA has analysts in place at strategic locations to assist units in tailoring training to their specific needs. The collaboration between the analyst and the college includes all course materials and train-the-trainer courses.

The soldiers gain an information edge for their mission analysis by using FalconView™ as a mission planning tool. The analyst trainer is able to adjust the course of study to enhance the students’ ability to see how GEOINT is used to prosecute military objectives based on their specific battle-space visualization requirements.

Course materials, including GEOINT data and contact information, are tailored to the specific mission requirements of the students. Analyst trainers also use student questions to guide the course of study to fit the mission requirements. In response, the analyst generates standard and non-standard GEOINT products, such as special-reference graphics. By integrating specific datasets, student needs, and visualization tools like FalconView™, students achieve a reliable understanding of their battle space.

“The training was quite effective and the take-home materials presented are excellent for further training,” wrote Warrant Officer Carolyn Compton, an all-source analyst technician, who recently provided feedback. P

JOSEPH RIGGS

is a geospatial intelligence analyst on the Army NGA Support Team, serving with III Corps at the Central Technical Support Facility, Fort Hood, Texas.



The Puerto Rico guard members received specific data sets over the Sinai Peninsula for upcoming service as peacekeepers with the Multinational Force and Observers (MFO). The MFO monitors access to the Gulf of Aqaba, on the peninsula’s east side (right) through the Strait of Tiran.

Naval Strike and Air Warfare Center Gets GEOINT

BY JOHN GRAY

Not so long ago, if you mentioned the words “geospatial intelligence” or “GEOINT” to Navy air crew and mission planners on a deploying aircraft carrier, they would have probably asked, “What’s that?”

Now, “geospatial” and “intelligence” are two words that are becoming part of every Navy warfighter’s lexicon, thanks to pre-deployment training at the Naval Strike and Air Warfare Center (NSAWC, pronounced “en-sock”). The center in Fallon, Nev., is where all naval aviators and intelligence personnel who deploy with carrier air wings train. The Strike Fighter Tactics Instructor (SFTI) program, better known by its code name, TOPGUN, has been located here since 1996.

Many Navy pilots have credited their success in combat to the realistic training they received at Naval Air Station (NAS) Fallon. It is the only facility in the Navy where an entire carrier air wing can train together in the strike tactics that have proven to be successful in combat. Although the air station is relatively small in size, the adjacent Fallon Range Training Complex includes four bombing ranges, an electronic warfare range, and miles of low-level navigation routes that combine to make NAS Fallon a premier U.S. Navy installation.

Focus of On-Site Support

The Navy NGA Support Team supports mission-planning teams and special operations forces at the training complex with GEOINT products and services that focus on intelligence preparation of the environment (IPE). By adding the dimension of GEOINT, NGA has been instrumental in changing the long-established Army term “intelligence preparation of the battlefield” to IPE. From satellite imagery of the Earth, analysts derive from either natural or manmade factors matters that have strategic and tactical implications.

Through its geospatial analyst assigned to NSAWC staff, NGA provides on-site tailored, customer-specific GEOINT analysis, services and solutions to a wide variety of Navy operators and trainers. This on-site NGA presence empowers students and staff with the tools and resources to better assess available intelligence prior to air wing mission planning. The enduring goal is to provide information excellence through geospatial data and applications that will ensure mission success.



NGA Staff Officer John Gray at right provides an instructor with a three-dimensional terrain model of his training area. The models enhance instructors’ ability to conduct pre-mission planning and post-mission analysis.

Accurate and Versatile Product

NGA and NSAWC staff recently collaborated on the production of a new military installation map (MIM) of the training complex. On one side, the product displays each of the four training ranges on a 1:50,000-scale terrain map, and on the flip side this same map data is printed on unclassified satellite imagery, which forms the background. Each map can be separated to form a functional topographic line map on one side with the added planning value of an imagery-based reference map on the other.

NGA’s Media Transformation Division (EDM) helped construct the map, which became known as the “Fallon Quad.” EDM printed the map on polypropylene, a material that combines the best characteristics of paper, film and fabric, as well as paper. Two materials were chosen to meet a requirement for a durable, all-weather material for special operations and escape-and-evasion ground training, in addition to the standard paper product.

The Fallon Quad provides a versatile tool for air and ground forces using any of the four training ranges. This one map shows contours, transportation routes and range facilities and enables mission planning teams to accurately plot targets against roads, buildings and other range information. The map also displays information specific to the Fallon range. NSAWC uses the new MIM to understand the regional terrain and how it affects the





Photo by MCSN Raul Quinones, US Navy.



Photo by MCSN Raul Quinones, US Navy.

Personnel of a visiting carrier air wing obtain NGA training about the uses of GEOINT in a structured classroom setting.

center's mission. The map provides a baseline for planning and coordinating vehicular travel time, fields of view and line-of-site assessments and target analyses for a given range operating area.

The imagery of the training complex uses one-meter Controlled Image Base® as a base for the geospatial data for one of the two versions. In the second version, digital elevation model (DEM) data is used. Each version has a specific customer. Ground forces prefer the imagery version because of the natural detail used for ground navigation, while aviators prefer the DEM's three-dimensional shaded relief display used for target area identification while in flight. The availability and integration of the two data layers creates a more realistic rendition of the area while clarifying specific features needed for navigation. The MIM incorporates current range information surveyed with the Global Positioning System and geodetic data to produce an accurate and versatile product.

3D Models

The NST has also provided NSAWC with three-dimensional terrain models from the NGA Three-Dimensional Production Facility. NSAWC uses the models for combat search and rescue training, real-life situational awareness and reconnaissance operations, convoy planning, and special operations training within the Fallon Range. These highly detailed terrain models take the next step beyond

on-screen, three-dimensional models by depicting key terrain and manmade features on a rigid and durable plastic surface that provides a scaled-down color representation of the entire range complex.

The truly exciting aspect of using terrain models is that they make the terrain come alive, clearly depicting the topography to provide an excellent tool for IPE. Looking at topographic features on the terrain model, you see them differently than you would if looking at contour lines on a map that depict the feature. You can visualize the terrain without actually being there. The terrain models have provided instructors with a highly detailed and accurate depiction of the training area that enhances their ability to conduct pre-mission planning and post-mission analysis.

Working together as mission partners, NSAWC and NGA are incorporating timely, relevant and accurate GEOINT into the tactics and skills used by our deploying naval aviation forces. P

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What I Learned About Iraq and Myself

BY AIR FORCE MAJ. GINA PREVETT

EDITOR'S NOTE: Beyond providing the best available geospatial intelligence to our warfighters, many members of the NGA workforce and their families are personally involved in the global war on terrorism. Some are or have been warfighters, serving as active members of the armed forces, as members of the National Guard, or as reservists on active duty. Others serve or have served on deployment as members of the NGA workforce, including assigned military personnel and contractors. Their collective experiences demonstrate the dedication of all Americans to the freedoms we hold dear. They bear witness to a highly motivated workforce that understands the Agency's

mission in very personal ways. The Pathfinder is pleased to present the following account as one of many stories behind the story of why NGA strives to make a crucial difference.

Until May 26, 2005, I learned everything that I knew about Iraq from the media. After spending four and a half months in Baghdad, I had a completely different outlook.

When's the last time you were sitting in your living room watching TV worrying that a rocket or mortar round might blast through the roof? When's the last time you were walking down the street and wondered if that car that was



Air Force Maj. Gina Prevett stands on a rooftop in The Green Zone in Baghdad just after an explosion.

Photo by Navy Lt. Cmdr. Bruce Roll



Maj. Gina Prevett (right) and Lt. Mike Reiners in a helicopter over Baghdad.

doing a U-turn just next to you was carrying a car bomb and might explode? And how many days or months have you had to go without running water in your house?

Most of us never have to endure what some experience when living in Iraq. I did endure some of it, and my experience was life-altering. Fortunately, I was never directly affected by violence when I was in Baghdad, but it was close enough to hit home. You learn a lot during a deployment to a hostile-fire zone, not only about the mission but about yourself.

It takes five days to reach Baghdad, part of that journey on a C-130 doing a combat landing and part on an armored bus that must arrive before dawn (“before the locals wake up”). In a combat landing, the pilot banks right and left, and then spirals towards the ground in a series of rapid maneuvers to avoid small-arms fire and attacks by SA-7 Grails—out-of-date ground-to-air missiles now in insurgent hands.

I worked with the coalition forces and learned about other cultures and their militaries. I learned about what was actually going on in Iraq, so when the news comes on, I can pick out the significant parts of the story. And I learned a lot about myself.

What I Learned about Iraq

I served in Baghdad with J3/Operations on the Joint Contracting Command-Iraq/Afghanistan. I volunteered for the deployment while I was working at Peterson Air Force Base, Colo., as an acquisitions officer for the Air Force Materiel Command’s Electronic Systems Center.

In addition to facing the dangers that Iraqis face each day, how would you feel if you had to walk through standing sewage on your way into work? Would you let your child play in a puddle of sewage? Most of us are appalled at these thoughts. As Americans, most of us never have to answer these kinds of questions. If you live in Iraq, however, the sewage problems are alive and well.

By the time the statue of Saddam Hussein toppled in 2003, Iraq’s infrastructure had already toppled and was in a state of disrepair. While the United States started our long-term battle of trying to gain freedom for the Iraqis, a lack of maintenance and sabotage by insurgents escalated the erosion of oil, water and sewage lines. Of the estimated 26 million Iraqi citizens, only about 6 percent live in a district that has a functional water treatment plant. Some families have septic tanks. Others dispose of waste any way they can.

In the United States, most of us take our water and sewage treatment plants for granted. In Iraq, where the sewer systems are inoperable or over capacity, it’s common for people to walk through streets or intersections full of standing sewage. On occasion, children play in the sewer water. The number of cholera cases increased 300 percent in 2004. Dr. Duraid al-Khatoun, a pediatrician at Children’s Teaching Hospital in Baghdad, told the United Nations’ Integrated Regional Information Networks (irinnews.org) that 90 percent of the cholera cases involved children living in suburbs where sewage treatment is non-existent. Cholera results in severe diarrhea and is caused by drinking contaminated water that has not been properly treated. It can lead to death.

Sadr City is one such location that faces an epidemic state of sanitation. The slum is located just northeast of Baghdad’s central business district. It houses over two million Iraqis. The Joint Contracting Command-Iraq/Afghanistan, consisting of Army, Navy and Air Force personnel, along with government civilians, contractors and Iraqi nationals, working out of the U.S. Embassy in Baghdad, along with the Coalition Provisional Authority, contracted to Washington International/Black & Veatch (WI/BV) Public Works Joint Venture to rehabilitate the sewage system infrastructure of Sadr City.

The \$46-million sewage rehabilitation project started May 30, 2004, and was completed on July 10, 2005. According to WI/BV sources, “The project included the rehabilitation of 11 sewage pump stations, the placement

of thousands of meters of major trunk sewers, 70 repairs of collapsed sewers, the installation of 5,200 meters of new force mains, and the reconstruction and paving of roads.” This project cleared much of the standing sewage from the streets. In time, it is hoped that cholera cases will decrease as a result of having operable sewage systems. Overall, the project has been one of the most visible signs of reconstruction in Baghdad.

At the peak of the project, WI/BV Public Works Joint Venture employed over 2,000 Iraqis. Ironically, it is believed that many of the trench laborers previously belonged to Sadr’s militia, also known as the Madhi Army. Prior to the project’s projected start date, that same militia fought coalition forces during the April 2004 Sadr City uprising.

At the beginning of the project, the *amanat*, which can be compared to a city council in the United States, encouraged the hiring of these militia members to work on the trenches. This idea seemed ludicrous at the time. Project leaders soon discovered, though, that replacing guns with shovels actually worked. The more the Iraqis participated in their city’s reconstruction, the more they realized they were doing something important for their family, city and country. They were also less likely to interact with the insurgency.

WI/BV project management staff acknowledges that the real heroes in this story are the Iraqis. They are the ones who truly made this project a success. The American employers distanced themselves from day-to-day construction activities. The project was managed remotely with frequent coordination between program managers, Baghdad municipal government leaders and Iraqi subcontractors.

Those Iraqi subcontractors received training on quality control and safety, and then the training was implemented and enforced in the field by Iraqi staff. Amazingly, over 1 million man-hours of work were completed with no injuries. This is almost unheard of in today’s workforce, especially in a more hostile environment like Iraq.

Despite the low profile maintained by American WI/BV staff, Iraqi project leads were still at risk of being threatened and intimidated on a daily basis. Their pictures cannot even be published for fear of reprisal against their families or themselves. Unfortunately, this type of counterproductive influence is still common for construction projects in Iraq. In spite of these dangers and risks, the Iraqis worked hand in hand with project managers toward the goal of providing badly needed infrastructure.

The reconstruction of the sanitation system was extremely visible and a benefit to Sadr City residents.

There was also a less obvious benefit: Because of this project, Iraqis took new pride in Sadr City. As construction crews arrived to fix the sewer systems, excited citizens greeted them. Men and women alike cheered. Some even brought out cold drinks for the workers. You would think the president or a movie star was arriving by the way the locals greeted the construction workers. As projects neared completion, WI/BV noted several instances where crowds of residents applauded and cheered as final pipe connections were made, alleviating a problem that had plagued residents for years in just a few minutes. These were scenes that had not been witnessed in Sadr City for some time.

The long-term goal for most of the U.S.-led projects is to hand them over to the Iraqis when the United States pulls out of the country. In the end, rehabilitating a sewage treatment system was just a minor step toward rebuilding a nation. The greater benefit was helping the proud citizens take charge of their future. When insurgents carry shovels instead of guns, Iraqis are one step closer to freedom.

What I Learned about Myself

When living in a hostile-fire zone, you really learn a lot about yourself. When mortar rounds exploded and nearly shook me out of bed, and incoming fire alarms resounded loudly, the primary thoughts that ran through my head were about my faith and family. Being in Iraq taught me to better appreciate what I have, to not take things so personally, to be more patient and to keep balance in my life.

When my 9-month-old, Jimmy, sticks his whole hand in his mouth with his mashed peas and then wipes his hand across his entire face, I try to savor the moment and let him experience all he needs to experience instead of worrying about the mess I’ll have to clean up later. And when my husband asks me to turn off the TV to just chat about life, I gladly turn it off (but only after pressing the record button ☺) and remember what I learned in Baghdad: how much my family means to me.

Because of what I learned in Iraq, I recommend a deployment to anyone who gets the opportunity. P

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Warfighters Get a Lift from Projects with MERIT

BY AIR FORCE MAJ. DOUG BRICK

If you use geospatial tools, there's a good chance that they reached your desktop through the MERIT program. MERIT stands for Military Exploitation of Reconnaissance and Intelligence Technology. Managed by the National Reconnaissance Office (NRO), MERIT is a program that solicits, assesses and funds selected advanced research and development projects to increase joint warfighters' access to intelligence from national systems and improve their capability to exploit that intelligence at the tactical level.

NGA is a vital cog in the MERIT program machinery. As the Functional Manager for geospatial intelligence (GEOINT), NGA is impacted by roughly 45 percent of all MERIT projects, and the number of projects is steadily increasing.

Focus Areas Addressed

The NGA MERIT Program specifically addresses five of the 12 Focus Areas defined by the senior leadership:

- » Look outward and be the most collaborative partner with the Intelligence Community and warfighter
- » Strengthen quality of analysis in concert with other Intelligence Community partners
- » Integrate airborne with National Technical Means and other sources
- » Implement an information technology structure to provide access to and discovery of GEOINT
- » Achieve front-end/back-end alignment extending from collection platforms to building a foundation knowledge base to providing comprehensive access to and assimilation of NGA products and services.

Through an interagency program, NGA assesses advanced research and development projects for the possibility of funding those that increase joint warfighters' access to national intelligence.



Over the last several years, NGA has supported MERIT projects for GEOINT processing, advanced GEOINT, automated change detection and Web-enabled access to data.

How MERIT Works

A MERIT Working Group composed of representatives from the services, Department of Defense intelligence agencies and Joint Staff reviews and assesses proposals for approval by NRO's Deputy Director for Mission Support. Proposals come from the combatant commands, mission partners, services, agencies including NGA, academia and industry. Prospective projects must address seven MERIT criteria as well as at least one thrust of the combatant commands. (See the sidebar.)

As a MERIT program mission partner, NGA receives and assesses proposals from across the Agency and MERIT community. NGA subject matter experts review the proposals and the originators receive feedback. During research and development, NGA provides a program manager and subject matter experts for project execution. NGA also assists in the transition from the research and development environment to operations.

NGA's Role in MERIT

The NGA MERIT Office within the Office of Future Warfare Systems (OMW) is the MERIT Working Group's contact for all projects related to GEOINT. Besides managing related projects and making recommendations to the MERIT Program Manager, the NGA MERIT Office may sponsor MERIT projects for the Agency or co-sponsor projects with other organizations. For capabilities developed through MERIT that transition to NGA, the Agency provides funding for operations and maintenance.

When NGA sponsors a project, a project lead is designated from the office that will derive the greatest benefit from the project. The project lead manages the project and guides it through the NGA technology-insertion process.

The budget for MERIT programs is relatively small, but these investments often have huge payoffs. NGA program managers who plan to compete for MERIT funds should coordinate through OMW. Look for project reports of recent successes like OCEAN TIDES (Overhead Coastal Environment Analysis from Tide Integrated Data Elements)

MERIT Project Criteria

MERIT projects must meet all of the following criteria:

- » improve national space reconnaissance contributions to military operations. "National space reconnaissance" is defined as NRO satellites, sensors, payloads and their associated tasking, processing, exploitation and dissemination
- » have joint service applications
- » address a specific thrust of a combatant commander
- » apply to tactical operations in a significant way
- » involve research and development prototyping
- » be employed within one-to-two years
- » transition to acquisition, operation and maintenance.

In addition, MERIT projects must address the improvement of at least one of the following combatant command thrusts:

- » intelligence, surveillance and reconnaissance (ISR) from national systems
- » national systems ISR support to military operations
- » processing, exploitation, dissemination and archiving of national systems data
- » national sensor awareness and management
- » battle-space awareness
- » U.S. support to communication and navigation
- » meteorological and oceanographic support
- » support to information operations.

and EQUIS (Enhanced Quality Imagery Search). Through this important program, NGA continues to provide critical GEOINT to warfighters around the world. P

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USING LESSONS LEARNED TO SUPPORT WARFIGHTERS

A Good Idea Deserves To Be Remembered — and Used Again

BY JOHN HUDSON

The NGA Lessons Learned Program was chartered in 2003 to support Operation Iraqi Freedom (OIF). Officials saw the program as critical to ensuring that successful practices of NGA during crises become benchmarks for the future.

The OIF Lessons Learned Program became the model for developing an expanded NGA Lessons Learned Program directed by the Joint Military Readiness Office (OMSR). The office ensures that the program collects, analyzes and records tactical and strategic lessons learned to identify changes that will improve NGA's support to warfighters.

Vice Adm. Robert B. Murrett emphasized his belief in the lessons-learned process in an e-mail to the workforce when he became the NGA Director: "As my tenure begins, I am confident that by working together, we will build on NGA's past accomplishments and lessons learned to ensure that the Agency remains the premier provider of GEOINT on which our national leaders, military and other valued customers depend," he stated.

Applying Lessons Learned

The NGA Lessons Learned Program supports the Director's guidance with a database that contains nearly 1,000 lessons-learned observations dealing with activities as diverse as OIF (328), Hurricane Katrina (158), deployer top issues (39) and the 2004 and 2006 Olympics (13).

In another e-mail to the workforce, Murrett stated, "A key Focus Area in our Agency is to be the Intelligence Community's and warfighter's most collaborative partner. A significant part of this encompasses hundreds of NGA personnel, civilian and military, who have deployed forward and work closely with operational counterparts."

We can best support the needs of our partners, particularly those of the warfighter, when we are embedded alongside them and working in direct support of them. Capturing the successes and shortfalls affecting the warfighter serves as a basis to find new ways to compress the timelines for delivering high-quality geospatial information.

An Excellent Example

The Office of Global Support (OGS), which supports deployed personnel, has been a major contributor to the

Lessons Learned Program. The office debriefs returning deployers, who provide valuable on-the-ground experience: What worked, and what did not? How was connectivity? Was reach-back support adequate or deficient? Did the supported warfighting command realize the full potential of the resources made available by the forward-deployed NGA analyst? These just a few of the questions deployers are asked.

From these debriefs, OGS gathers insights and maintains a list of deployer top issues. Top issues may include training needs, information-technology support, staffing requirements at forward-deployed sites, or organizational or structural changes needed in reach-back relationships.

The relationship of OSMR with OGS is an excellent example of the relationship the Lessons Learned Program needs with all NGA directorates and offices. NGA uses the lessons learned it derives from deployer insights to improve services and products for the warfighter.

Documentation Is Key

The Lessons Learned Program assists directorates and offices in documenting what works, what does not, what needs to change, and what needs to remain the same. After all, the same questions apply to all NGA organizations: Are the best service, products and support possible being provided to the warfighter in a timely manner? How can products and services be improved to support the warfighter?

The workforce can contribute directly to supporting warfighters better and faster. All are invited to contact the Lessons Learned Team in NGA's Joint Military Readiness Office to find out how to participate in the lessons-learned process, as well as to take advantage of the historical knowledge that already exists. P

JOHN HUDSON

supports the NGA Lessons Learned Program in the Joint Military Readiness Office.



PARTNERSHIPS

Collaboration Is Cornerstone of UFAC

BY SCOTT ROBERTSON

NGA is an on-site component of the Underground Facilities Analysis Center (UFAC), which celebrates its 10th anniversary this year.

The UFAC is the national center dedicated to identifying, understanding and ultimately defeating the strategic and tactical use of underground facilities by adversarial states and organizations. The Defense Intelligence Agency (DIA) established the UFAC in 1997 in response to a directive from the Director of Central Intelligence.

Before the UFAC's creation, the United States had no single authority to respond to the requirements generated by national decision-makers, military commanders or the weapons-acquisition community. Part of the solution resided in the Intelligence Community (IC), some in the operational targeting field, part in the nuclear defense arena, and some in the research and development establishments.

The establishment of the UFAC foreshadowed the Commission on Weapons of Mass Destruction's call in 2005 for "more collaboration among analysts across the Intelligence Community—that is, to bring the benefits of collaboration to daily support to the President, to strategic intelligence and warning, and to assistance to military, law enforcement and homeland security efforts."

At the UFAC, collaboration is a cornerstone of our daily business. In fact, in many ways we are one of a kind. How many elements or centers within the IC combine both intelligence and non-intelligence organizations to find, identify, analyze and defeat sites that directly threaten the United States or our allies with weapons of mass destruction?

UFAC Has Diverse Team

A diverse team of all-source analysts, engineers, geologists, modelers, imagery analysts, geospatial analysts, research and development scientists, collection strategists and collection managers constitutes the UFAC. On-site components include the DIA, Defense Threat Reduction Agency, NGA and National Security Agency (NSA). We have extensive reach-back to DIA, NGA and NSA, as well as collaboration with the CIA, National Reconnaissance Office and U.S. Geological Survey. We also partner with the Department of Energy, combatant commands, national laboratories, industry, academia and U.S. allies.

Geospatial intelligence (GEOINT) plays a critical role in the analysis of underground facilities and UFAC's success.

Sites that directly threaten the United States and its allies are the focus of the Underground Facilities Analysis Center, whose mission is to find, identify, analyze and defeat them.



The key to defeating hardened and deeply buried targets is multi-intelligence collaboration. The NGA element embedded with the UFAC provides dedicated geospatial intelligence on site.

The NGA element embedded with the UFAC provides dedicated on-site GEOINT, including searching for, assessing, and monitoring undergrounds. Two branches at NGA also provide key analysis to the underground issue. Each branch has a complementary approach to the daunting task of analyzing undergrounds. Other NGA elements contribute to the UFAC via collection, data integration, broad-area search programs, the development and evaluation of tools and methodologies, and reach-back to the functional and regional offices. The geologists, geospatial analysts, imagery analysts and imagery scientists work together to help the UFAC satisfy its many customers.

Today, the Director of National Intelligence sponsors the center, with its charter to:

- » establish and sustain a coordinated, collaborative approach for the detailed understanding of the essential features of adversarial underground facilities throughout the world
- » build and maintain effective analytical capability with the Center using on-site and off-site components from DIA and other agencies

» foster partnerships with operational customers and supporting U.S. national decision-makers, weapons developers, and U.S. and combined operational forces to ensure the threats posed by the functions concealed in underground facilities are neutralized or minimized.

Although DIA is the Executive Agent of the Center, the UFAC also receives oversight from the Office of the Director of National Intelligence and the Under Secretary of Defense for Intelligence. This guidance comes through the Underground Facility Senior Steering Group, co-chaired by Dr. Larry Gershwin, National Intelligence Officer for Science and Technology, and Thomas Behling, Deputy Under Secretary of Defense for Preparation and Warning in the Office of the Under Secretary of Defense for Intelligence. This direction shows the reliance that senior intelligence officials and senior defense officials have on the UFAC's analyses and products.

Rigorous Training Offered

Analyzing underground facilities is complex and complicated. Our adversaries constantly improve their techniques and capabilities for constructing, engineering and protecting these hard and deeply buried targets. A rigorous internal training program enables the UFAC to keep pace with these developments. Courses range from a high-level orientation seminar to a weeklong comprehensive analysis and production class that includes imagery analysis, signals intelligence, engineering characterization, collection management, human intelligence, a national systems overview, and a writing seminar. Our "school house" also offers five days of in-depth training on facility databases. And for the really ambitious students, we offer a five-day comprehensive engineering course on characterizing and exploiting the vulnerabilities of underground facilities.

Plans are under way to celebrate the UFAC's 10th anniversary with a conference and Dining Out later this year. P

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INDUSTRY

Warfighter to Get GEOINT on a Wristband and More

BY DR. MARK E. BARNES

Imagine, if you will, warfighters wearing displays on their wristbands that transmit geospatial intelligence (GEOINT) instantly via wireless communications. Sound like something out of “Dick Tracy” or “Star Trek”? Well, maybe not. An exciting evolution in the display and micro-electronics industries may change the way NGA supports warfighters in the near future.

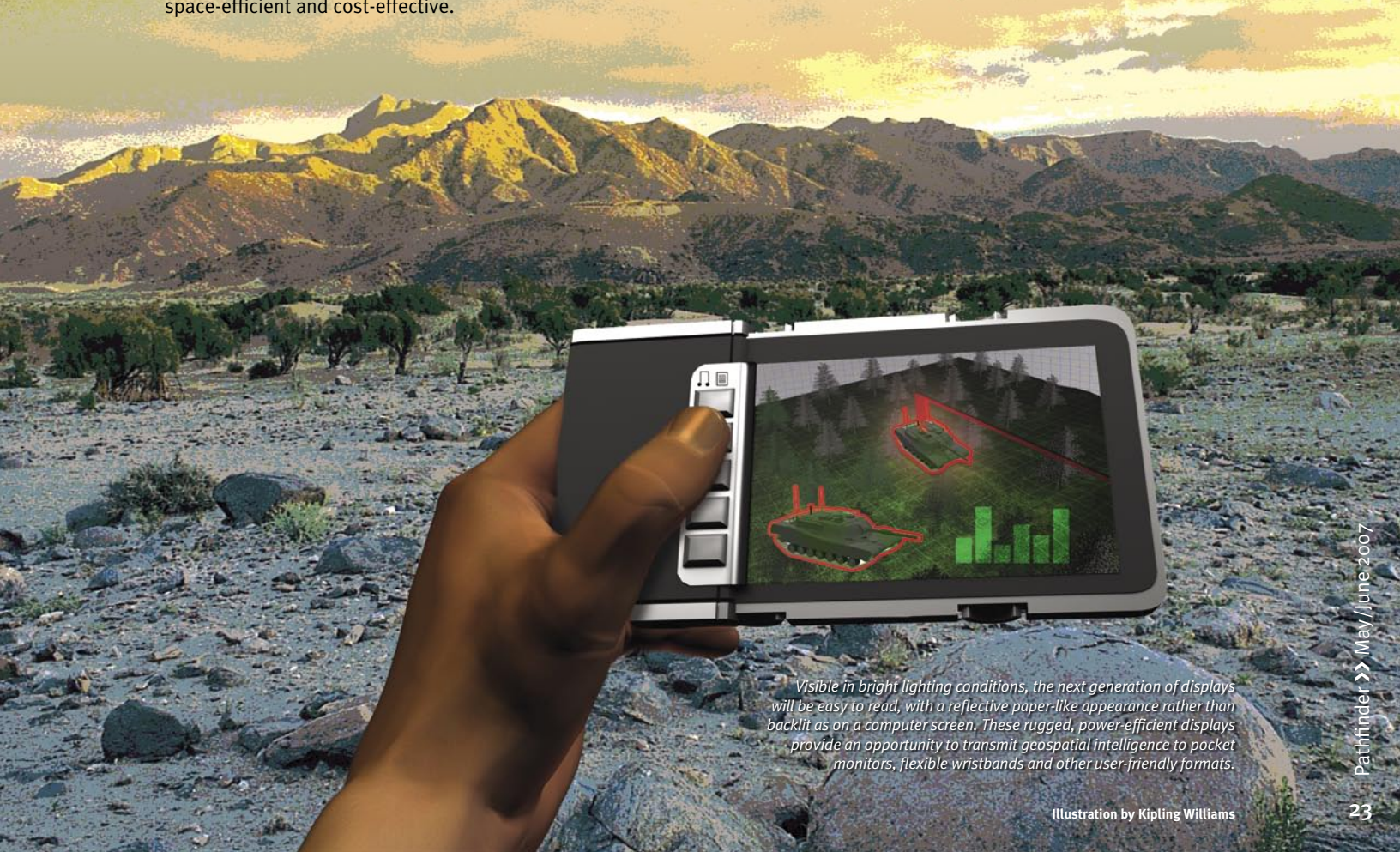
The U.S. Display Consortium (USDC) is an industry-led public/private partnership of flat panel display manufacturers, users and suppliers that aims to create specifications for, research and develop the next generation of display technology. Recently USDC convened its members to report on progress toward solving technical and production obstacles and to discuss future product launches and market projections.

Much remains to be accomplished, but the industry is on its way to producing displays that are more mobile, space-efficient and cost-effective.

What Are Flexible Displays?

Flexible displays are part of the evolution from displays on cathode ray tubes to liquid crystal displays (LCDs) and displays using organic light-emitting diode (OLED) technology. OLEDs are powered by directly exciting organic compounds, typically oil-based materials, which are sandwiched between a front plane and a back plane and encased by a coating material. When the materials are produced in thin enough dimensions, the displays become flexible—capable of bending. Examples include plastic instead of glass, thinner metals and coatings, and electronic circuits printed directly on paper.

OLEDs offer many advantages over LCD technology. They can be used to produce displays that are thin, light, bright and colorful, and which do not require the use of rigid glass and dimensional stability. OLEDs also do not require backlighting. This gives them two advantages over



Visible in bright lighting conditions, the next generation of displays will be easy to read, with a reflective paper-like appearance rather than backlit as on a computer screen. These rugged, power-efficient displays provide an opportunity to transmit geospatial intelligence to pocket monitors, flexible wristbands and other user-friendly formats.

Illustration by Kipling Williams



LCDs: they are more power-efficient, and they are more visible in bright lighting conditions. On the downside, OLEDs have short longevity, currently relegating them to research and development concepts and cheaper products.

The Flexible Display Industry

There is promise for producing flexible display products, but it is taking longer to commercialize them than anticipated. One potential catalyst is the Flexible Display Center at Arizona State University, funded by the Army Research Laboratory (ARL). Opened in 2004, the center focuses on enhancing the development of flexible display technology aimed at commercial applications. But because of the strong overlap between military needs and potential civilian markets, the thought is that it will also benefit the military. The Army foresees being able to use displays that can be carried on or stuck to various surfaces in and on vehicles.

The industry is composed of only a few manufacturers and many more material makers and researchers. Due to technical challenges behind each of the components and the huge capital expenditures required for production, each company focuses on one or two aspects. Few companies will initially make the transition to production, due to technical and cost obstacles.

The industry is still in its infancy, meaning that it is resolving some of the product and production hurdles but still trying to define who the ultimate customer will be and what products will be offered. Polymer Vision is launching the first commercial product this year, a handheld device that displays monochrome text files, such as e-mail, and is aimed at the individual consumer market.

Material Hurdles

There is no one best solution for creating flexible displays. Therefore, different groups have chosen to pursue different approaches. In a nutshell, the difficulty comes down to being able to adhere thin film transistors (TFTs) to thinner plastics and metals and encasing them in thinner plastics using efficient manufacturing processes. While this might not seem insurmountable on the surface, there are significant hurdles. For instance, OLEDs quickly decay when exposed to air, and scientists have not yet been able to create a thin plastic coating that is impermeable enough to reach an acceptable specification.

One of the greatest challenges manufacturers face is making affordable products. There are huge capital

expenditures needed for developmental research and production equipment. Thus, no company is attempting to produce end-to-end products. Rather, each is developing a single component and working with a team to produce whole products. The production of OLEDs costs less than silicon transistors, however, because the process is simpler and can be done at room temperature. To reduce costs further, a trend is developing toward printing the electronics on continuous sheets rather than by batch mode.

Future Trends

So, what can we at NGA and as consumers expect? In the near future, manufacturers will likely focus on low-cost, low-quality products first. This may include toys, lighting and advertising displays that can be made of thicker materials, use passive OLEDs and have short life expectancies. As material advances are made, thinner and more flexible products will emerge, with better quality in terms of resolution and color. Products will move from being stand-alone to being integrated into larger products and systems. Components will become commoditized, making them cheaper and increasing the ways that they can efficiently be combined to make new products. They also will become more sophisticated, allowing for advances in fields like medicine, where scientists are experimenting with stretchable microelectronics for cochlear implants and communicable prosthetic skin. The exact products that come to market will continue to be consumer-driven.

The government will gain access to displays and microelectronics that are rugged, wearable, transferable and energy-efficient. Users will be able to place them in vehicles, and they will be easy to read, with a reflective paper-like appearance rather than backlit as on a computer screen.

With real-time GEOINT at the flick of their wrists, warfighters will have dynamic and wireless access to maps and imagery that are truly embedded in their environment. The future may be nearer than it seems! P

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WORKING FOR NGA

Deputy MX Shares Experience as EUCOM NST Chief

BY JUANITA HARTBARGER

Joel Maloney, NGA's Deputy Military Executive, has just returned from Germany as Chief of the NGA Support Team for the U.S. European Command (EUCOM), one of nine unified combatant commands (COCOMs) worldwide. Maloney, who has served as NST Chief at two of the six regional COCOMs, has deep roots in the intelligence business.

"I have been with NGA since 1997," he said. "I also worked in private industry as a defense intelligence consultant for several years. During much of my time in industry, I was assigned to the former National Photographic Interpretation Center (NPIC), where I supported work on imagery-related technical-development issues."

Maloney joined the National Imagery and Mapping Agency, now NGA, as a senior policy officer in the Office of International Affairs and Policy. He was Chief of the U.S. Pacific Command NST in Hawaii from 2001 to 2005.

"The principal mission of a regional COCOM is to plan and conduct military operations," Maloney said. "These may vary from highly sensitive special military operations to broad-based theater security cooperation programs."

COCOMs are joint military commands, composed of forces from two or more services, with a broad and continuing mission. "The pace of work is always rapid because the COCOM and its leadership are literally on the

front lines of U.S. national security activities." Maloney noted that an NST assignment presents exciting opportunities. "This 'battle rhythm,' as it is often called, requires us on the NST to be rapid and agile when responding to the command's constantly evolving requirements for geospatial intelligence (GEOINT)."

Time is the biggest challenge. "While we have to get our COCOM partners the most accurate and comprehensive GEOINT support possible, we almost always have the added element of timeliness to contend with," Maloney said. "Time management, workload prioritization and proactively understanding our partners' mission needs are critical to our NSTs' mission success."

Being There Is Key

Maloney brought a range of experience on military issues to his work as a COCOM NST Chief, including his service as a Foreign Affairs Policy Officer at the Office of the Secretary of Defense, an all-source intelligence analyst at Marine Corps Headquarters and an intelligence officer in the Navy Reserve. He observed that even in this age of high-tech, high-bandwidth information flows, working directly with the mission partner brings added value to the development of effective GEOINT support.

"There is a saying in the military that 'virtual presence is real absence,'" Maloney said. "There is simply no substitute for being out there, up close and personal with our partners, to understand their mission and needs and how we can best bring GEOINT to their fight."

Being that full-time partner, however, comes with challenges. The EUCOM NST, for example, employs government and contractor personnel at locations throughout Europe. Those personnel must be "familiar with almost every aspect of what NGA does, from the substance of our intelligence analysis and geospatial production activities to the Agency's extensive technical services, policy, programmatic, research and development, acquisitions, and source operations," Maloney said. The payoff, he adds, is that "every day is different, and you can often see the direct impact of your efforts."

High-Level Access

As EUCOM NST Chief, Maloney had access to the highest levels of the command structure. "I was considered to



Celebrating 40 years in Stuttgart, Germany, the U.S. European Command is one of the unified combatant commands supported by NGA on site.





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—Joel Maloney, Deputy MX

be part of the command’s most senior staff, along with the command’s own general/flag officers and other civilian senior executives,” he said. This tight integration with the staff very rewarding,” he added. “My family and I lived on base and participated in essentially all of the command’s senior professional activities, as well as the many off-hours official and unofficial social and international representational activities.”

While those demands made for long hours, “in return, I had privileged insight into the command’s perspectives, future plans and needs,” he said. “Where appropriate, I was even able to be part of the command’s decision-making process.”

Although Maloney’s experience was in a leadership role during both his NST tours, he has definite ideas on how imagery analysts, geospatial analysts, staff officers and other NGA professionals could benefit from serving at a regional COCOM NST.

“NGA analysts will be required to take the initiative on analytical support needs, operate autonomously, and resolve problems quickly with a minimum of supervisory guidance,” he said. Because in most cases NGA analysts are fully integrated into their partner organizations’ military staffs, they will be involved in the military support mission and operational planning activities of their command partners. Maloney said that “for many NGA analysts, this is one of the first times they have had the opportunity to work alongside our military mission partners.”

“The regional COCOM NSTs employ a large and growing number of NGA staff, technical and source-operations

officers,” Maloney noted. “These individuals routinely deal with very senior command leaders and work issues that span the spectrum of NGA’s programmatic, policy, acquisitions, enterprise operations, source operations and research and development activities.” In addition, Maloney points out, “The NST is also responsible for coordinating NGA’s COCOM support activities with activities of the other national agencies that operate in theater.”

He strongly endorses service at a NST as a positive career move.

“For aspiring leaders, COCOM NST assignments provide practical opportunities for leadership experience in an environment that is about as challenging as one can find,” he said. “And for those senior executives looking to expand their horizons beyond NGA’s immediate Washington, D.C., or St. Louis mission set, a tour as a COCOM NST Chief will be among the most challenging—and rewarding—of their careers.”

With more than 20 years’ experience, Maloney can still say about his time as EUCOM NST Chief, “This has been the most demanding job of my career so far.” P

JUANITA HARTBARGER

is a Public Affairs Staff Officer in the Office of Corporate Relations, Strategic Communications Branch.



21ST CENTURY

Toolkit Empowers Warfighters for Net-Centric Warfare

BY SUSAN MARCHANT

NGA is leading the way in geospatial visualization and analysis tools for net-centric warfare, leveraging the latest and greatest in commercial-off-the-shelf technologies. Our Commercial Joint Mapping Toolkit (CJMTK) empowers warfighters with situational awareness.

“CJMTK is a critical enabler to our Battle Command migration to a service-oriented architecture,” says Col. Harold Greene, Project Manager for Battle Command, a unit of the Army Program Executive Office for Command, Control and Communications Tactical (PEO C3T). “Today, we are hamstrung in showing a common picture by multiple map engines and displays with unique interfaces.”

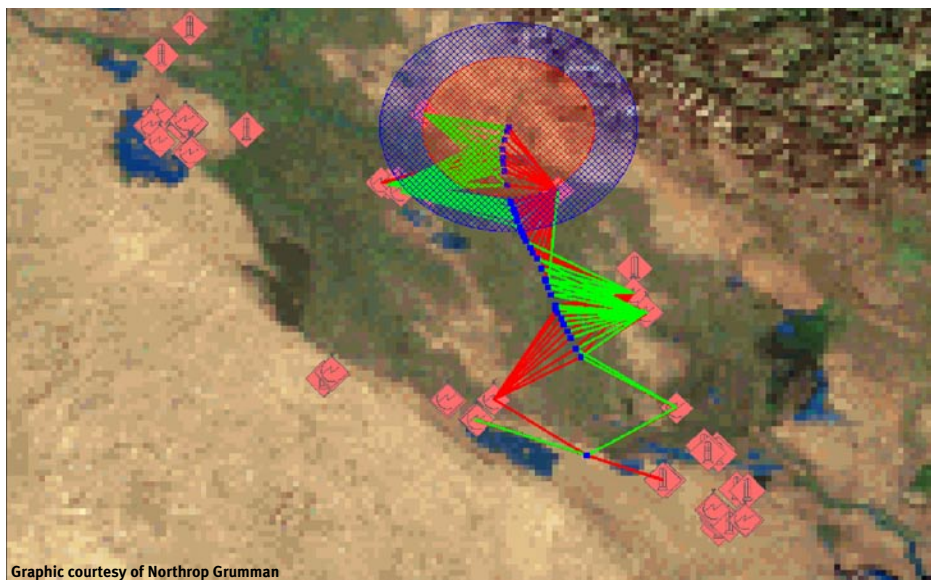
Driving to a Common Viewer

The Army “is driving to a common viewer with a known interface for all of our functional services,” Greene said. “CJMTK provides that to us today. We’ve already seen great improvement in interoperability for those systems we’ve migrated to CJMTK.”

NGA was providing a Joint Mapping Toolkit (JMTK) to the Command, Control and Intelligence (C2I) community through the Defense Information Systems Agency (DISA) Common Operating Environment when Congress mandated the toolkit’s commercialization. Three years later—in 2002—NGA acquired the CJMTK following a successful source-selection competition.

What is a “Toolkit”?

The CJMTK is not a stand-alone application. It is a collection of software components that the C2I developers embed into their mission applications to support the use of standardized geospatial visualization and analysis tools tailored to their specific missions. By using a suite of ArcGIS™ tools, the C2I community obtains the advantage of interoperability without the costs of licensing and maintenance. Other advantages of the commercial toolkit include the availability of worldwide training, increases in functionality through incremental enhancements,



Graphic courtesy of Northrop Grumman

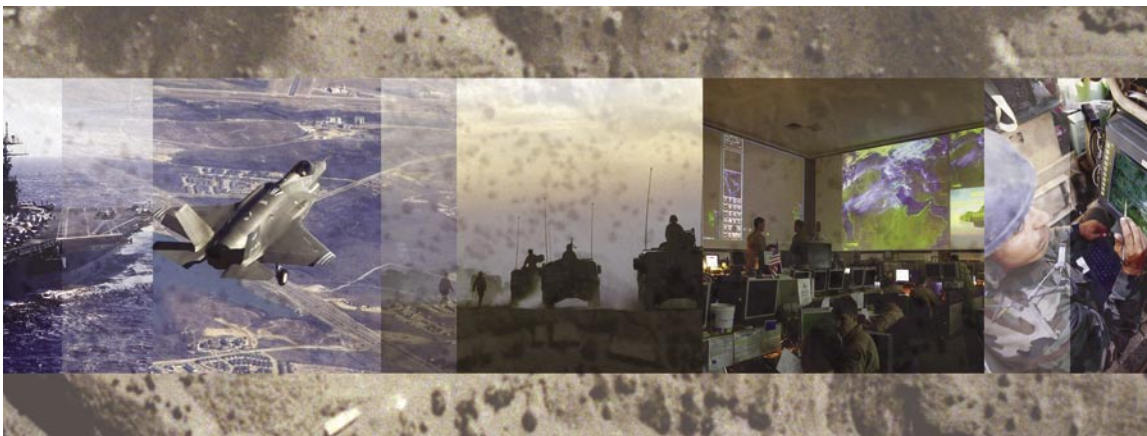
Line-of-sight route analysis, shown above, is a potential application of the Commercial Joint Mapping Toolkit. The prototype is under consideration for the Joint Mission Planning System, which already uses the toolkit to integrate weather information from Web mapping services.

standardization and the ability to capitalize on the latest technical benefits and economies of scale.

CJMTK is available through three major licensing options:

- » Option 1, for the C2I community, provides free access, centrally funded by NGA, through the DISA Common Operating Environment and Net-Centric Enterprise Services.
- » Option 2, for the extended user community, is available to users who do not qualify as members of the C2I community but want to be interoperable with the CJMTK community at their own expense.
- » Option 3, for foreign governments, provides access through a U.S. government sponsor by purchasing seats through a Foreign Military Sales office.

This toolkit and its license agreement translate into a bundle of functionality that has far-reaching possibilities for the military services as they move into the realm of joint net-centric warfare and service-oriented architecture.



The Commercial Joint Mapping Toolkit has far-reaching possibilities for the military services as they move into the realm of joint net-centric warfare, enabling warfighters to plan, execute, report and visualize a common operating picture.

Payoffs

The C2I community has already capitalized on the advantages of the CJMTK, fielding over 235 mission-approved applications. For example, the Coast Guard's Search and Rescue Optimal Planning System is built on CJMTK technology. The system provides geographic displays of optimal search areas for missing mariners or vessels using data such as last known position and potential drift intervals.

An early adopter of CJMTK, the Army's Maneuver Control System, continues to harness CJMTK's power of visualizing and sharing geospatial intelligence (GEOINT) by integrating commercial technology into the tactical environment. Planners use the system to understand the battlefield and plan actions to achieve the commander's objectives. Both rely on the system to deliver accurate information about friendly and enemy capabilities and locations, weather, terrain, obstacles and other GEOINT.

The Air Force Portable Flight Planning System and Joint Mission Planning System are integrating CJMTK to provide the capabilities of an advanced geographic information system to the C2I mission-planning community. These systems have the ability to consume a wide variety of information from Web mapping services and through direct access to geographic databases. Both systems, for example, use CJMTK to integrate weather information from Web mapping services into the mission-planning environment.

A collaborative effort of DISA and the Global Command and Control System is the Joint Web Common Operational

Picture (COP). This system uses CJMTK to provide a simple, intuitive user interface that enables soldiers to view critical information without extensive training. By distributing data-access and map-production capabilities to existing C2I systems, Joint WebCOP reduces the processing performed on its server. The distributed C2I systems feed information back to the Joint WebCOP server in Extensible Markup Language (XML) or as a simple map image. Any platform with network connection and a Web browser may view the COP.

Strange but True

Although NGA funds the CJMTK program, the Agency is not qualified as a user due to the fact that CJMTK is for the exclusive use of the C2I community. However, NGA has other licenses and avenues for obtaining the same functionality.

As Functional Manager for the National System for Geospatial Intelligence, NGA enables warfighters to plan, execute, report and visualize the COP through CJMTK. With over 145,000 users, or "run-time seats," CJMTK is on the rise. More information about CJMTK is available at www.CJMTK.com. P

SUSAN MARCHANT

works in the Acquisition Directorate's CJMTK Program Office.



OUR HERITAGE

Photographer Pioneered Aerial Reconnaissance 'For the Lives of Men'

BY DR. GARY E. WEIR

"I [finally] have an opportunity to get off a letter to Paris.... [T]he railroads are being used by the military—I only know that war is inevitable now," the American photographer Edward Steichen wrote to his friend Alfred Stieglitz in New York in one of his letters now stored in the Steichen Archive of the Beinecke Library at Yale University.

It was 1914—the year the European Great Powers initiated a war that changed the world forever—and that momentarily stranded Steichen with his family in the French village of Voulangis.

That summer Steichen sent his loved ones to relatives in Great Britain and departed himself for New York City via Marseilles on board the steamer SS Sant'Anna. The location of his French home permitted him to see some of the early fighting, to sense the change of mood in France, and to witness the effect of mobilization. He certainly had no illusions about the horror unfolding before his eyes.

When the United States entered the war in 1917, Steichen received a commission from the Army and shipped out with the American Expeditionary Force (AEF) to France as a specialist in aerial reconnaissance. Unlike many of his fellows in the art world, Steichen, a naturalized citizen from Luxembourg, felt a strong compulsion in both world wars to serve his adopted country close to the front. He also felt that his extraordinary skills with a camera would both aid the American cause and vividly demonstrate the waste and absurdity of war.

From Pigeons to Airplanes

Armies had long since realized the advantages of photographic aerial observation. In 1903 the Germans developed a 70-gram homing pigeon camera that took 38-millimeter negatives automatically every 30 seconds. When the United States entered the Great War in 1917, the Army followed suit with a pigeon system that took pictures of the enemy lines.

The First World War also provided the opportunity to combine airplane technology with the still-image camera. This step gave the armed forces the ability to move, see and record the Earth in a more systematic manner. The reliability, regularity and responsiveness of the airplane



Photo courtesy of the U.S. Army Center for Military History

Aerial reconnaissance captures a gas attack on the Western Front. An accomplished artist striving to make photography an art form before World War I, Edward Steichen led the wartime effort to transform aircraft photography into reliable and timely intelligence.

permitted conversion of the data gathered into reliable and timely intelligence.

Under Steichen's direction the AEF in France successfully made the transition to aircraft photography. An accomplished artist in oils who struggled just before the war to raise photography to an art form, he now advised the Army on the best way to use the large, aircraft-mounted cameras. In short order he significantly improved the results presented to Army senior leadership, as he regularly moved between AEF headquarters and the front lines. Of course, security regulations and access to classified methods and materials permitted him to tell his friends via his letters home only a small part of what he did for the warfighter.

Greeting Stieglitz in one of his letters, Steichen remarked, "Well, here I am in the famous 'somewhere in France'—hard at it . . . and once again for photography—only this time . . . photography and plus. I suppose that means the lives of men. I wish I could tell you about it but that is naturally taboo...."

Imagery Reconnaissance Operations

Steichen eventually commanded a reconnaissance unit on the Western Front consisting of 55 officers and 1,111





Photo courtesy of the U.S. Army Center for Military History

An aerial photo of Vaux, in northeastern France, shows damage after its capture by the U.S. Army's Second Division July 1, 1918. Photographer Edward Steichen commanded an aerial reconnaissance unit on the Western Front that could place, on demand, as many as 4,000 black-and-white prints before the American Expeditionary Force leadership.

enlisted soldiers. The unit daily provided Gen. Billy Mitchell's air staff with imagery intelligence, recounts Catherine Tuggle in "Edward Steichen: War, History and Humanity," in the *History of Photography*, vol. 17, number 4 (Winter 1993). Before America's two years of war concluded, Steichen had implemented image gathering and overnight processing procedures that could daily place, on demand, as many as 4,000 black-and-white prints of the Western Front before the AEF leadership, Tuggle writes.

Aerial photographs not only revealed troop movements and enhanced cartographic services but also offered more reliable battle-damage assessments based upon images captured before and after bombardment from the air or by artillery. Steichen and his staff helped military leaders standardize many other techniques, including the use of multiple images to produce three-dimensional effects, enhancing detection further.

This aerial intelligence pioneer always viewed his part in the Great War as simply part of life, always keeping it in perspective. He clearly realized the war's excitement, its value to his personal development and its terrible absurdity.

"It's a great game—life—when it goes at such a pace and when the price [of life] counts as little as it does here," he wrote Stieglitz. "And whether it's the thump thump thump of marching troops or a delicious Sole frite [fried fish] with a bottle of Barsac—what's the difference—or freezing up in the air [gathering imagery] or feeling like a corpse in a cold, damp has been a bed—it is full and rich with meaning—even though [it is] the result of human imbecility."

After the war concluded in 1919, Steichen returned to New York City and worked for Condé Nast publications, virtually defining American fashion and portrait photography while gaining a reputation as one of the world's great imagery artists. P

DR. GARY E. WEIR

recently assumed duties as the NGA Historian. A former member of the history faculty at the U.S. Naval Academy, he spent the last decade as head of the Contemporary History Branch of the U.S. Naval Historical Center, a component of the Office of the Chief of Naval Operations.



NEW CAMPUS EAST

Public Reviews Environmental Impact Statement

BY GAIL CAPP

When the federal government conducts its business, the impacts to the environment must be considered, as required by the National Environmental Policy Act (NEPA). For major activities, such as construction, NEPA requires that an environmental impact statement (EIS) be prepared to document impacts on air quality, water quality, land use, cultural and natural resources, transportation services, hazardous materials, energy usage and socio-economic factors. The construction of the New Campus East (NCE), as part of the Department of Defense 2005 Base Realignment and Closure (BRAC) program, requires that the potential environmental impacts be documented in an EIS.

An EIS is a public document that provides full and unbiased discussion of significant environmental impacts of a federal undertaking and informs decision-makers and the public of the reasonable alternatives to the proposed action that would avoid or minimize adverse impacts or enhance the quality of the human environment.

On Nov. 23, 2005, the Army published a Federal Register "Notice of Intent to Prepare Environmental Impact Statements for Realignment Actions Resulting From the 2005 Base Closure and Realignment Commission's Recommendations." This was the first step in the process to prepare the EIS. Since the publication of this notice, the

Army has met with interested and affected parties, including civic groups, local and state government agencies, and transportation providers, to address concerns and gather input for the draft EIS (DEIS). Input from interested parties helps the Army identify impacts and develop strategies for minimizing the impacts.

The DEIS for the BRAC actions at Fort Belvoir was released on March 2, 2007. It contains an evaluation of the environmental impacts of four land-use plans. The Preferred Alternative identifies NGA being sited at the Engineer Proving Ground. The public was invited to review the DEIS during a 60-day open comment period. All comments are recorded and evaluated. Based on their content, the Army will determine what responses need to be sent to the submitters and determine if changes need to be made in the final EIS (FEIS). Once the FEIS is prepared, its availability will be announced to the public. The Army must take comments received into consideration when making the final decision, which is documented in the Record of Decision (ROD).

The ROD is the final step in the EIS process, after which NGA will be able to start construction of NCE. The Army will ensure that the mitigation measures, monitoring programs, or other requirements committed to in the FEIS and ROD are accomplished during the construction of NCE. P

GAIL CAPP

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NGA's planned New Campus East is on the Engineer Proving Ground, outlined in yellow, as shown in a Draft Environmental Impact Statement released by the Army in March. The NGA site, outlined in blue, is west of Interstate 95 and south of Springfield, Va.

IN CLOSING

Former NGA Director Clapper New USD (I)

Retired Air Force Lt. Gen. James R. Clapper Jr. assumed the duties of the Undersecretary of Defense for Intelligence in a ceremony at the Pentagon April 13.

The former Director of NGA was nominated to be the Pentagon's intelligence undersecretary by President Bush on Jan. 29 and confirmed by the Senate on April 11. The first civilian director of NGA, Clapper served from September 2001 to June 2006. He retired from the Air Force in 1995, after a 32-year career. He was a business executive before and after he came to NGA.

Clapper's last military assignment was as Director of the Defense Intelligence Agency. His earlier assignments included a variety of intelligence-related positions such as assistant chief of staff, intelligence, Headquarters U.S. Air Force, during Operations

Desert Shield/Desert Storm, and as director of intelligence for three war-fighting commands: U.S. Forces, Korea; Pacific Command; and Strategic Air Command. P



DoD photo by R. D. Ward.

Secretary of Defense Robert M. Gates, right, swears in retired Air Force Lt. Gen. James R. Clapper Jr. as the Undersecretary of Defense for Intelligence during a private ceremony in the Pentagon April 13. Clapper's wife Susan holds the Bible as the oath of office is administered.

Recognizing the Contributions of a Diverse Workforce

In recognition of the contributions of a diverse workforce, NGA's Office of Diversity Management and Equal Employment Opportunity sponsors several events and workshops. Black history, deaf and hard-of-hearing awareness, and women's history are some of the topics. Through their personal stories, guest speakers discuss their heritage and challenges they've faced and overcome. These events are widely publicized and attended by the NGA workforce.

Christy Smith, the first deaf contestant on the CBS show "Survivor," spoke to the NGA workforce on April 2 as part of Deaf and Hard of Hearing Awareness Month. This event is one of several monthly diversity functions sponsored by NGA.



Photo by Larry Franklin



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